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Weak invariants of time-dependent quantum dissipative systems

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Abstract

© 2016 American Physical Society.The concept of weak invariant is introduced. Then the weak invariants associated with time-dependent quantum dissipative systems are discussed in the context of master equations of the Lindblad type. In particular, with the help of the su(1,1) Lie-algebraic structure, the weak invariant is explicitly constructed for the quantum damped harmonic oscillator with the time-dependent frequency and friction coefficient. This generalizes the Lewis-Riesenfeld invariant to the case of nonunitary dynamics in the Markovian approximation.

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